RAYS THE SKY IS THE LIMIT MED/ENGG. ENTRANCE COACHING

AIIMS BATCH ADMISSION TEST - 2018

ANSWER KEY - VERSION CODE – A

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
D	**D**	**D**	**D**	**D**	**D**	**A**	**D**	**B**	**B**	**B**	**A**	**B**	**C**	**A**
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
B	**A**	**D**	**A**	**A**	**C**	**D**	**B**	**B**	**B**	**B**	**B**	**B**	**C**	**A**
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
B	**C**	**A**	**B**	**A**	**A**	**B**	**D**	**A**	**D**	**A**	**C**	**D**	**A**	**C**
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
A	**D**	**C**	**D**	**D**	**C**	**A**	**D**	**C**	**A**	**B**	**C**	**B**	**B**	**C**
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
C	**D**	**D**	**B**	**B**	**B**	**C**	**B**	**C**	**C**	**D**	**D**	**B**	**B**	**C**
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
D	**C**	**C**	**D**	**B**	**A**	**A**	**A**	**B**	**D**	**D**	**B**	**D**	**D**	**D**
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
A	**C**	**A**	**D**	**A**	**D**	**C**	**C**	**C**	**B**	**D**	**A**	**B**	**D**	**D**
106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
B	**C**	**B**	**B**	**B**	**D**	**A**	**C**	**B**	**B**	**A**	**C**	**A**	**A**	**A**
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
B	**D**	**B**	**B**	**D**	**B**	**A**	**B**	**B**	**D**	**B**	**C**	**D**	**B**	**B**
136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
B	**D**	**D**	**D**	**D**	**B**	**B**	**A**	**B**	**A**	**B**	**B**	**C**	**D**	**C**
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165
C	**A**	**A**	**D**	**C**	**B**	**B**	**D**	**C**	**B**	**A**	**B**	**B**	**A**	**A**
166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
C	**A**	**C**	**B**	**D**	**B**	**B**	**C**	**B**	**B**	**B**	**B**	**B**	**B**	**B**

VERSION CODE – B

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
D	**B**	**B**	**B**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**B**	**B**	**A**	**A**
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
B	**D**	**A**	**D**	**D**	**B**	**C**	**A**	**D**	**D**	**D**	**D**	**D**	**D**	**A**
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
D	**B**	**B**	**B**	**A**	**B**	**A**	**A**	**A**	**C**	**D**	**A**	**D**	**C**	**A**
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
C	**A**	**B**	**C**	**D**	**A**	**D**	**C**	**B**	**B**	**C**	**C**	**A**	**D**	**C**
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
B	**A**	**A**	**C**	**D**	**B**	**A**	**D**	**C**	**C**	**A**	**B**	**B**	**B**	**C**
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
B	**D**	**D**	**D**	**D**	**D**	**B**	**D**	**D**	**C**	**C**	**C**	**C**	**C**	**D**
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
B	**B**	**B**	**C**	**D**	**C**	**A**	**A**	**D**	**D**	**A**	**B**	**A**	**B**	**A**
106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
D	**A**	**B**	**C**	**D**	**D**	**C**	**B**	**A**	**D**	**B**	**B**	**C**	**B**	**A**
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
D	**B**	**C**	**B**	**A**	**B**	**A**	**B**	**D**	**D**	**C**	**C**	**A**	**A**	**C**
136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
B	**B**	**D**	**B**	**D**	**C**	**B**	**B**	**D**	**B**	**B**	**D**	**B**	**A**	**B**
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165
D	**B**	**B**	**D**	**B**	**B**	**B**	**C**	**D**	**D**	**B**	**B**	**C**	**A**	**C**
166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
B	**B**	**C**	**B**	**B**	**B**	**A**	**A**	**B**	**A**	**D**	**B**	**B**	**B**	**B**

RAYS MED/ENGG. ENTRANCE COACHING
THE SKY IS THE LIMIT

AIIMS BATCH ADMISSION TEST - 2018

WARNING : Any attempt to commit malpractice in the examination will lead to the 'Disqualification' of the candidate

PHYSICS, CHEMISTRY & BIOLOGY

Version Code	**A**	
Time : 3 Hours	Number of Questions: 180	Maximum marks : 720

Name of Candidate	
Reg. Number	
Signature of Candidate	

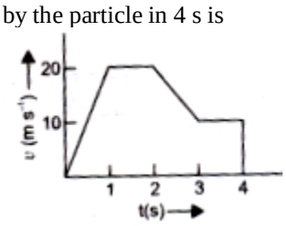
INSTRUCTIONS TO CANDIDATES

1. **Write your Name and Reg. number and put your signature in the space provided above**
2. **Use blue or black ink ball point pen for bubbling.**
3. **Use of calculators and logarithm tables are prohibited.**

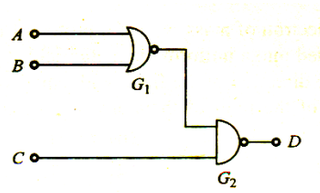
IMMEDIATELY AFTER OPENING THE QUESTION BOOKLET, CANDIDATE SHOULD VERIFY WHETHER THE QUESTION BOOKLET ISSUED CONTAINS ALL THE 180 QUESTIONS IN SERIAL ORDER. IF NOT, REQUEST FOR REPLACEMENT

DO NOT OPEN THE BOOKLET UNTIL THE INVIGILATOR ASKS YOU TO DO SO

1. Which of the following quantities has unit Newton per metre (N m^{-1}) ?
   a) force b) Power
   c) Energy d) surface tension.
2. The variation of velocity of particle moving along a straight line is shown in figure. The distance travelled by the particle in 4 s is



   a) 25 m b) 30 m c) 55 m d) 60 m
3. Which of the following is wrong about uniform motion
   i) acceleration is zero
   ii) The magnitude of velocity is equal to speed
   iii) The average velocity is equal to instantaneous velocity
   iv) It is not on straight line path and have different directions.
   a) (i) & (iii) b) (i, ii, iv) c) All d) iv
4. A projectile thrown with a velocity ν at an angle θ has a range R on the surface of earth. For same ν and θ, its range on the surface of moon will be
   a) 36 R b) R/36 c) R/6 d) 6R
5. A body is thrown with a velocity of 10 ms^{-1} at an angle of 60^0 with the horizontal. Its velocity at the highest point is
   a) 7 m s^{-1} b) 9 m s^{-1} c) 18.7 m s^{-1} d)5 m s^{-1}
6. The coefficient of friction between two surfaces is 0.2. The angle of friction is
   a) $\sin^{-1}$ (0.2) b) $\cos^{-1}$ (0.2)
   c) $\tan^{-1}$ (0.1) d) $\cot^{-1}$ (5)
7. Which one among the following shows particle nature of light?
   a) Photoelectric effect b) Interference
   c) Refraction d) Polarization
8. The angle of dip at a place on the earth gives
   a) the horizontal component of the earth's magnetic field
   b) The location of the geographic meridian
   c) the vertical component of the earth's field
   d) The direction of the earth's magnetic field
9. A device which converts electrical energy into mechanical energy is
   a) induction coil b) Electric motor
   c) Generator d) Dynamo
10. Kirchhoff's first law ($\sum$ i = O) and second law ($\sum$ iR = $\sum$E), where symbols have their usual meanings, are, respectively, based on
    a) Conservation of momentum, conservation of energy
    b) Conservation of charge, conservation of energy
    c) Conservation of charge, conservation of momentum
    d) Conservation of energy, conservation of charge
11. A current i ampere flows along an infinitely long straight thin-walled tube. Then the magnetic induction at any point inside the tube is
    a) Infinite b) zero
    c) $\frac{\mu_0}{4\pi}\frac{2i}{r}$ tesla d) $\frac{2i}{r}$ tesla
12. To demonstrate the phenomenon of interference, we require two sources which emit radiation
    a) Of the same frequency and having a definite phase relationship
    b) Of nearly the same frequency
    c) Of the same frequency
    d) Of different wavelengths
13. Consider tele communication through optical fibres. Which of the following statements is not true?
    a) Optical fibres can be of graded refractive index
    b) Optical fibres are subjected to electromagnetic interference from outside
    c) Optical fibres have extremely low transmission loss
    d) Optical firbes may have homogenous core with a suitable cladding
14. The instrument for the accurate measurement of the emf of a cell is
    a) A slide wire bridge b) An ammeter
    c) A potentiometer d) A voltmeter
15. A steady current flows in a metallic conductor of non-uniform cross-section. Which of the following quantities is constant along the conductor?
    a) Current b) drift speed
    c) Current density d) None of these
16. The force between two charges 0.06 m apart is 5 N. If each charge is moved towards the other by 0.01 m, then the force between them will become
    a) 7.20 N b) 11.25 N c) 22.50 N d) 45.00 N
17. The displacement of the interfering light waves are $y_1 = 4 \sin \omega t$ and $y_2 = 3 \sin (\omega t + \pi/2)$. What is the amplitude of the resultant wave?
    a) 5 b) 7 c) 1 d) Zero
18. For the given combination of gates, if the logic states of inputs, A, B, C are as follows A = B = C = 0 and A = B = 1, C = 0 then the logic states of output D are



    a) 0, 0 b) 0, 1 c) 1,0 d) 1, 1
19. For a Plano-convex lens for which μ = 1.5, has radius of curvature 10 cm. It is silvered on its plane surface. Find focal length after silvering
    a) 10 cm b) 20cm c) 15 cm d) 25 cm
20. A bullet of mass 0.1 kg is fired with a speed of 100ms^{-1}, the mass of gun is 50 kg. The velocity of recoil is
    a) 0.2 ms^{-1} b) 0.1 ms^{-1} c) 0.5 ms^{-1} d) 0.05 ms^{-1}
21. A stone of mass 1 kg tied to the end of a string of length 1 m, is whirled in a horizontal circle with a uniform angular velocity of 2 rad s^{-1}. The tension of the string is (in N)
    a) 2 b) $\frac{1}{2}$ c) 4 d) $\frac{1}{4}$

22. During the adiabatic expansion of 2 moles of a gas, the internal energy was found to have decreased by 100 J. The work done by the gas in the process is
a) Zero b) -100 J c) 200 J d) 100 J

23. A hot liquid takes 5 minutes to cool from 70°C to 60°C. How long will it take to cool from 60°C to 50°C?
a) 5 minutes b) More than 5 minutes
c) Less than 5 minutes
d) Less or more than 5 minutes depending on the nature of liquid.

24. The pitch of a screw gauge is 0.5 mm. Its head scale contains 50 divisions. The least count of the screw gauge is
a) 0.001 mm b) 0.01 mm c) 0.02 mm d) 0.025 mm

25. The energy required to accelerate a car from rest to 10 ms^{-1} is E. what energy will be required to accelerate the car from 10 ms^{-1} to 20 ms^{-1}?
a) E b) 3E c) 5E d) 7 E

26. A person with his hands in his pockets is skating on ice at the rate of 10 ms^{-1} and describes a circle of 50m radius. What is his inclination to the vertical ? (Given : g = 10 ms^{-2}).
a) $\tan^{-1}\left(\frac{1}{2}\right)$ b) $\tan^{-1}\left(\frac{1}{5}\right)$
c) $\tan^{-1}\left(\frac{3}{5}\right)$ d) $\tan^{-1}\left(\frac{1}{10}\right)$

27. A particle is confined to rotate in a circular path with decreasing linear speed. Which of the following is correct?
a) $\vec{L}$ (angular momentum) is conserved about the centre
b) Only direction of angular momentum $\vec{L}$ is conserved
c) It spirals towards the centre
d) Its acceleration is towards the centre

28. A uniform spherical shell gradually shrinks maintaining its shape. The gravitational potential at the centre
a) Increases b) Decreases
c) Remains constant d) Oscillates

29. Two point charges placed at a distance r in air experience a certain force. Then the distance at which they will experience the same force in a medium of dielectric constant K is
a) r/K b) Kr c) $\frac{r}{\sqrt{K}}$ d) $r\sqrt{K}$

30. The resistance of the series combination of two resistance is S. When they are joined in parallel, the total resistance is P. If S = nP, then the minimum possible value of n is
a) 4 b) 3 c) 2 d) 1

31. A microammeter has a resistance of 100Ω and a full scale range of 50μA. It can be used as a voltmeter or as a higher range ammeter provided a resistance is added to it. Pick the correct range and resistance combination
a) 50 V range with 10 KΩ resistance is series
b) 10 V range with 200 KΩ resistance is series
c) 10 mA range with 1 Ω resistance in parallel
d) 10 mA range with 1 Ω resistance in parallel

32. The earth's magnetic field at a certain place has a horizontal component 0.3 gauss and the total strength 0.5 gauss. The angle of dip is
a) $\tan^{-1}\frac{3}{4}$ b) $\sin^{-1}\frac{3}{4}$ c) $\tan^{-1}\frac{4}{3}$ d) $\sin^{-1}\frac{3}{5}$

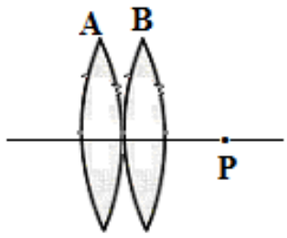
33. A 0.1 m long conductor carrying a current of 50 A is perpendicular to a magnetic field of 1.25 mT. the mechanical power required to move the conductor with a speed of 1 ms^{-1} is
a) 6.25 mW b) 6.25 W c) 0.625 W d) 1 W

34. A cell whose diameter is 0.40 m is in a variable magnetic field. As the magnetic induction of the field changes by 127.4 T during 2s, an emf of 200 V is induced in the coil. Then the number of turns in the coil is approximately
a) 20 b) 25 c) 30 d) 50

35. Power factor is one for
a) Pure resistor
b) Pure inductor
c) Pure capacitor
d) Either an inductor or a capacitor

36. The speed of electromagnetic wave in a medium of dielectric constant 2.25 and relative permeability 4 is nearly
a) 1×10^8 ms^{-1} b) 2.5×10^8 ms^{-1}
c) 2×10^8 ms^{-1} d) 3×10^8 ms^{-1}

37. Two convex lenses placed in contact form the image of a distant object at P. If the lens B is moved to the right, the image will



a) Move to the left
b) Move to the right
c) Remain at P
d) Move either to the left or right, depending upon focal lengths of the lenses.

38. A beam of light of wavelength 600 nm from a distant source falls on a single slit 1 mm wide and a resulting diffraction pattern is observed on a screen 2 m away. The distance between the first dark fringes on either side of central bright fringe is
a) 1.2 cm b) 1.2 mm c) 2.4 cm d) 2.4 mm

39. In two separate set-ups of the Young's double slit experiment, fringes of equal width are observed when lights of wavelengths in the ratio 1 : 2 are used. If the ratio of the slit separation in two cases is 2 : 1, the ratio of distances, between the plane of slits and the screen, in the two set ups is
a) 4 : 1 b) 1 : 1 c) 1 : 4 d) 2 : 1

40. The number of photo electrons emitted for light of a frequency v (higher than the threshold v_0) is proportional to
a) Frequency of light (v) b) $v - v_0$
c) Threshold frequency (v_0) d) Intensity of light

Directions for question 41 to 60

In each of the following questions a statement of Assertion is given followed by corresponding statement of Reason just below it. Of the statements mark the correct answer as

A) If both Assertion and reason are true the reason is the correct explanation of the Assertion

B) If both Assertion and Reason are true but the Reason is not the correct explanation of the Assertion

C) If Assertion is true but Reason is false

D) If both Assertion and Reason are false

E) The Assertion is false but the reason is true

41. **Assertion :** If bodies slide down on a smooth inclined plane without rolling then all bodies reach the bottom simultaneously
Reason : Acceleration of all bodies are equal and independent of the shape
a) A b) B c) C d) D
42. **Assertion :** In an elastic collision in one dimension between two bodies, total momentum remains the same before, during and after the collision
Reason: In an elastic collision in one – dimension between two bodies, total kinetic energy remains the same before, during and after the collision. [Assume external forces are absent in both the above statements)
a) A b) B c) C d) D
43. **Assertion:** Some work (non zero) has to be done on a moving particle to change its momentum.
Reason: To change momentum of a particle a non-zero net force should act on it
a) A b) B c) C d) D
44. **Assertion:** A rocket moves forward by pushing eh surrounding air backwards
Reason: It derives the necessary thrust to move forward according to Newton's third law of motion.
a) A b) B c) C d) D
45. **Assertion:** Use of ball bearings between two moving parts of a machine is a common practice
Reason: Ball bearings reduce vibrations and provide good stability
a) A b) B c) C d) D
46. **Assertion:** A man in a closed cabin falling freely does not experience gravity.
Reason: Inertial and gravitational mass shave equivalence
a) A b) B c) C d) D
47. **Assertion:** If we assume that there only two bodies, earth and sun, in the universe. Their size, shape and motion remains same. A frame placed on sun is an inertial frame.
Reason: Inertial frame is non-accelerating in mature.
a) A b) B c) C d) D
48. **Assertion**: An iron ball and a wooden ball are both released at the same height. In the presence of a medium both the balls reach the ground with different velocities and different times.
Reason: Both the ball reach the ground simultaneously.
a) A b) B c) C d) D
49. **Assertion**: Least count of all screw based instruments is same.
Reason: Least count for all screw based instruments are found using the ratio pitch per division of circular scale.
a) A b) B c) C d) D
50. **Assertion**: Time period of a hollow ball will be more than that of a solid ball of same radius
Reason: Time period is independent of mass or distribution but on $\sqrt{l}$, where l is the distance between the point of suspension and the centre of the bob.
a) A b) B c) C d) D
51. **Assertion** : If the length of a simple pendulum increases by 3%, then the percentage change in time period will be 1.5%.
Reason : The time period is directly proportional to the length of the pendulum
a) A b) B c) C d) D
52. **Assertion** : The lightening conductor at the top of a high building has sharp ends.
Reason : The surface density of charge at sharp points is very high, resulting in setting up of electric wind
a) A b) B c) C d) D
53. **Assertion** : In a Meter Bridge experiment, null point for an unknown resistance is measured. Now, the unknown resistance is put inside an enclosure maintained at a higher temperature. The null point can be obtained at the same point as before by decreasing the value of the standard resistance.
Reason : Resistance of a metal increases with increase in temperature
a) A b) B c) C d) D
54. **Assertion** : Two bulbs of 40 W and 60 W are connected in series across a d.c source. The potential difference across the 60 W bulb is more than that across the 40 W bulb.
Reason : In a series combination, the potential difference across a bulb is directly proportional to its resistance
a) A b) B c) C d) D
55. **Assertion** :A proton and an alpha particle, having the same kinetic energy, are moving in circular paths in a uniform magnetic field. The radii of their circular paths will be equal.
Reason : Any two charged particles having equal kinetic energies and entering a region of uniform magnetic field $\vec{B}$, in a direction perpendicular to $\vec{B}$, will describe circular trajections of equal radii
a) A b) B c) C d) D
56. **Assertion** : Susceptibility is defined as the ratio of intensity of magnetization *I* to magnetic intensity *H*.
Reason : Greater the value of susceptibility, smaller the value of intensity of magnetization
a) A b) B c) C d) D

57. **Assertion** : The coil of a moving coil galvanometer is iscillating. If the two ends of the coil are connected, the oscillations will suddenly stop.
Reason : A current is induced in the coil which opposes the change in flux through the coil
a) A b) B c) C d) D

58. **Assertion** : For an electric lamp connected in series with a variable capacitor and an AC source ; its brightness increases with increase in capacitance.
Reason : Capacitive reactance decreases with increase in capacitance of capacitor
a) A b) B c) C d) D

59. **Assertion** : A concave mirror and convex lens both have the same focal length in air. When they are submerged in water, they will have same focal length.
Reason : The refractive index of water is smaller than the refractive index of air
a) A b) B c) C d) D

60. **Assertion** : In young's double – slit experiment the two slits are at a distance d apart. Interference pattern is observed on a screen at a distance D from the slits. At a point on the screen which is directly opposite to one of the slits a dark fringe is observed. Then the wavelength of the wave is proportional to the square of the distance between the slits.
Reason : For a dark fringe intensity is zero
a) A b) B c) C d) D

61. Which of the following shall form an octahedral complex?
a) d^4 (low spin) b) d^8 (high spin)
c) d^6 (low spin) d) all of these

62. Consider the following relations for emf of an electrochemical cell
(i) EMF of cell = (Oxidation potential of anode) – (Reduction potential of cathode)
(ii) EMF of cell = (Oxidation potential of anode) + (Reduction potential of cathode)
(iii) EMF of cell = (Reductional potential of anode) + (Reduction potential of cathode)
(iv) EMF of cell = (Oxidation potential of anode) – (Oxidation potential of cathode)
a) (iii)and (i) b) (i) and (ii)
c) (iii) and (iv) d) (ii) and (iv)

63. The correct order of decreasing acidity of nitrophenols will be
a) m – nitrophenol > p– nitrophenol > o – nitrophenol
b) o – nitrophenol > m – nitrophenol > p– nitrophenol
c) p– nitrophenol > m – nitrophenol > o – nitrophenol
d) p– nitrophenol > o – nitrophenol > m – nitrophenol

64. The d – electron configuration of Cr^{2+}, Mn^{2+}, Fe^{2+} and Ni^{2+} are $3d^4$, $3d^5$, $3d^6$ and $3d^8$ respectively. Which one of the following aqua complexes will exhibit the minimum paramagnetic behavior?
(At. No. Cr = 24, Mn = 25, Fe = 26, Ni = 28)
(a) $[Fe(H_2O)_6]^{2+}$ (b) $[Ni(H_2O)_6]^{2+}$
(c) $[Cr(H_2O)_6]^{2+}$ (d) $[Mn(H_2O)_6]^{2+}$.

65. The solubility of metal halides depend on their nature, lattice and hydration enthalpy of the individual ions. Amongst fluorides of alkali metals, the lowest solubility of LiF in water is due to
a) ionic nature of lithium fluoride
b) high lattice enthalpy
c) high hydration enthalpy of lithium ion
d) low ionization enthalpy of lithium atom

66. Which ordering of compounds is according to the decreasing order of the oxidation state of nitrogen?
a) HNO_3, NO, NH_4Cl, N_2 b) HNO_3, NO, N_2, NH_4Cl
c) HNO_3, NH_4Cl, NO, N_2 d) NO, HNO_3, NH_4Cl, N_2

67. For a reaction, $X \rightarrow Y$, the graph of the product concentration (x) versus (t) came out to be a straight line passing though the origin. Hence the graph of $\frac{-d[X]}{dt}$ and time would be
a) straight line with a negative slope and an intercept on y – axis
b) straight line with a positive slope and an intercept on y – axis
c) a straight line parallel to x- axis
d) a hyperbola

68. Which one of the following statement is wrong?
a) Greater the gold number of protective colloid, less is its protective power.
b) Hardy – Schulze rule is applicable only to the coagulation of lyophilic sols.
c) Greater flocculation value of an electrolyte means its poor coagulating power
d) For coagulation of a positive sol, positive ions of the electrolyte have no significance

69. Benzoyl peroxide has a role in which of the following type of addition polymerization?
a) Cationic b) Anionic
c) Free – radical d) None of these

70. For which of the given sulphides auto – reduction is not applicable?
a) CuS b) PbS
c) FeS d) HgS

71. Oxygen is more electronegative than sulphur. Yet H_2S is acidic while H_2O is neutral. This is because
a) water is a highly associated compound
b) molecular mass of H_2S is more than that of H_2O
c) H_2S is gaseous under ordinary conditions while H_2O is a liquid
d) H – S bond is weaker than H – O bond

72. When 2- methyl butan -1- ol is dehydrated to give an alkene; the preferred product is
a) 2- methyl but -1- ene
b) but -1- ene
c) but -2- ene
d) 2- methyl but -2- ene

73. Which of the following is correct for an ideal gas?
a) $\left(\frac{\partial E}{\partial T}\right)_v = c$ b) $\left(\frac{\partial E}{\partial P}\right)_T = 0$
c) $\left(\frac{\partial E}{\partial T}\right)_P = 0$ d) All of these

74. Which blue solid is obtained on reacting equimolar amount of NO and NO_2 gases at – 30°C?
a) N_2O b) N_2O_3
c) N_2O_4 d) N_2O_5

75.  (Ketone) can be reduced to RCH_2CH_3 (alkane) by

I. $LiAlH_4$ II. P/ HI

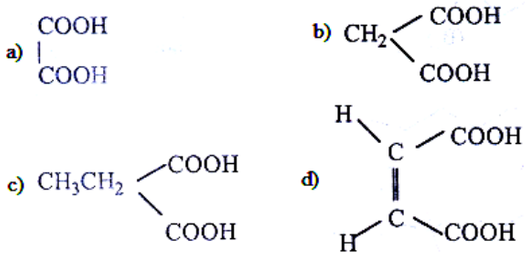
III. Zn(Hg/ con: HCl IV. N_2H_4/C_2H_5ONa

Select correct reagents

a) I, II and III b) I, III and IV

c) I, II and IV d) II, III and IV

76. An organic compound which readily decolourised bromine water and forms an anhydride on heating could be



77. Ice crystallizes in hexagonal lattice. At certain temperature, the density of ice was 0.94 g cm^3. The volume of the unit cell is 1.3×10^{-22} cm^3. The number of H_2O molecules per unit cell is

a) 3 b) 6 c) 4 d) 2

78. For a given reaction of first order, it takes 20 minutes for the concentration to drop from 1.0 M lit^{-1} to 0.6 M lit^{-1}. The time required for the concentration to drop from 0.6 M lit^{-1} to 0.36 M lit^{-1} will be

a) more than 20 minutes

b) less than 20 minutes

c) equal to 20 minutes

d) infinity

79. Buffer solution can be prepared from a mixture of

a) sodium acetate and acetic acid in water

b) sodium acetate and hydrochloric acid in water

c) Ammonia and ammonium chloride in water

d) Both (a) and (c)

80. Which of the following is not characteristic of Planck's theory of radiation?

a) Radiation is associated with energy

b) Energy is not absorbed or emitted in whole number or multiples of quantum

c) The magnitude of energy associated with a quantum is proportional to the frequency

d) Radiation energy is neither emitted nor absorbed continuously but in small packets called quanta.

81. Arrange the following in the increasing order of size

a) $Al^{3+} < Mg^{2+} < Al < Mg$

b) $Mg < Al < Mg^{2+} < Al^{3+}$

c) $Al^{3+} < Al < Mg^{2+} < Mg$

d) $Mg^{2+} < Al^{3+} < Al < Mg$

82. Calculate the wave number for the longest wavelength transition in the Balmer series of atomic hydrogen.

a) 1.523×10^6 m^{-1} b) 1.523×10^8 cm^{-1}

c) 1.523×10^{-6} m^{-1} d) 1.63×10^6 cm

83. The following is not an example of gaseous air pollutants:

a) oxides of halogens b) oxides of sulphur

c) oxides of carbon d) oxides of nitrogen

84. If the solubility product K_{sp} of a sparingly soluble salt MX_2 at 25^0C is 1.0×10^{-11}, the solubility of the salt in mol $litre^{-1}$ at this temperature will be :

a) 2.46×10^{14} b) 1.36×10^{-4}

c) 2.60×10^{-7} d) 1.20×10^{-10}

85. Identify the correct statement regarding entropy:

a) At 0^oC, the entropy of a perfectly crystalline substance is taken to be zero

b) At absolute zero of temperature, the entropy of a perfectly crystalline substance is +ve

c) At absolute zero of temperature, the entropy of all crystalline substance is taken to be zero

d) At absolute zero of temperature, the entropy of a perfectly crystalline substance is taken to be zero

86. The reaction / method that does not give an alkane is

a) Catalytic hydrogenation of alkenes

b) Wurtz reaction

c) Hydrolysis of alkylmagnesium bromide

d) Dehydrohalogenation of an alkyl halide

87. The correct order of first ionization potential is

a) K > Na > Li b) Be > Mg > Ca

c) B > C > N d) Ge > Si > C

88. Calcium crystallizes in a face centred cubic lattice and is reported to have 0.2% Schottky defects. If edge length of the unit cell is 5.7×10^{-8} cm, the density of the crystal is

a) 1.54 g cm^{-3} b) 1.02 g cm^{-3}

c) 0.92 g cm^{-3} d) 1.432g cm^3

89. The structure and hybridization of $Si(CH_3)_4$ are:

a) bent, sp b) trigonal, sp^2

c) octahedral, sp^3d^2 d) tetrahedral, sp^3

90. Flux is used in blast Furnace to

a) Remove all impurities form ores

b) Reduce metal oxide

c) Remove silica

d) Remove silica and undesirable metal oxide

91. Tyndall effect in colloidal solution is due to

a) Scattering of light b) Reflection of light

c) absorption of light

d) presence of electrically charged particles

92. $N_2 + 3H_2 \rightleftharpoons 2NH_3$. This is gaseous phase reaction taking place in 1L flask at 127^oC. Starting with 1 mol N_2 and 3 mol H_2, equilibrium mixture required 500mL of 1 M HCI. Hence K_c is approximately

a) 0.06 b) 0.08 c) 0.03 d) 2.05

93. A raw material used in making nylon -66 is:

a) Adipic acid b) Butadiene

c) Ethylene d) Methyl methacrylate

94. Butanone when treated CH_3OH gives

a) Hemi acetal b) acetal

c) Cyclicketal d) None

95. Which reagent is used to convert 2-butanone into propanoic acid?

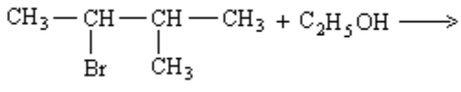
a) NaOH, I_2/H^+ b)Tollens' reagent

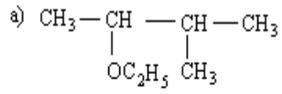
c) Fehling's solution d) NaOH, NaI/H^+

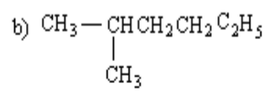
96. Which of the following is isoelectronic as well as isostructural with N_2O?

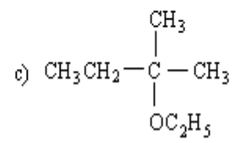
a) HN_3 b) H_2O c) NO_2 d) CO_2

97. The major product via S_N1, reaction is



a) 

b) 

c) 

d) None

98. Out of Cu, Ag, Fe and Zn, the metal which can displace all others from their salt solutions is
    a) Ag
    b) Cu
    c) Zn
    d) Fe
99. The basic character of transition metal monoxide follows the order
    a) VO > CrO > TiO > FeO
    b) CrO > VO > FeO > TiO
    c) TiO > FeO > VO> CrO
    d) TiO > VO > CrO > FeO
100. Which of the following complexes is inner orbital complex?
    a) $Ni(CO)_4$ b) $[Fe(CN)_6]^{4-}$
    c) $[CoF_6]^{3-}$ d) $[Ni(NH_3)_6]^{2+}$

Directions for Qus. 101 to Qus.120 : In every question a statement of ASSERTION followed by a statement of REASON is given. Mark the correct answer out of the following choices.

A. If both assertion and reason are true and the reason is a correct explanation of the assertion.

B. If both assertion and reason are true but reason is not a correct explanation of the assertion.

C. If the assertion is true but reason is false.

D. If both the assertion and reason are false

E. If the assertion is false but the reason is true

101. **Assertion :** trans – butene on reaction with bromine forms racemic mixture.
    Reason: trans – compound in trans addition forms two types of stereoisomers.
    a) A b) B c) C d) D
102. **Assertion :** C – O bond in metal carbonyl is long .
    Reason: There is delocalization of electrons from filled d orbitals into the empty orbitals on the CO lignads.
    a) A b) B c) C d) D
103. **Assertion :** The pressure of a fixed amount of an ideal gas is proportional to its absolute temperature.
    Reason: The frequency of collisions and their impact both increase in proportion to the square root of temperature.
    a) A b) B c) C d) D
104. **Assertion :** O_3 can act as an oxidizing agent as well as a reducing agent, but SO_2 can act only as an oxidant.
    Reason: The oxidation number of O in O_3 is zero, and the oxidation number of S in SO_2 is +4.
    a) A b) B c) C d) D
105. **Assertion:** If H_2 and Cl_2 enclosed separately in the same vessel exert pressure of 100 and 200 mm respectively, their Mixture in the same vessel at the Same temperature will exert a pressure of 300 mm.
    Reason : Dalton's law of partial pressures states that total pressure is the sum of partial pressures.
    a) A b) B c) C d) D
106. **Assertion :** Bleaching powder reacts with dilute acids to evolve chlorine.
    Reason : The chlorine liberated by the action of dilute acids on bleaching powder is called available chlorine.
    a) A b) B c) C d) D
107. **Assertion :** A reaction which is spontaneous and accompanied by decrease of randomness must be exothermic
    Reason : All exothermic reactions are accompanied by decease of randomness.
    a) A b) B c) C d) D
108. **Assertion :** *p*ara N-dimethylaminobenzaldehyde undergoes benzoin condensation.
    Reason : The aldehydic (-CHO) group is meta directing.
    a) A b) B c) C d) D
109. **Assertion:** Ebonite is highly vulcanised rubber.
    Reason: Perlon is used in the manufacture of fibres.
    a) A b) B c) C d) D
110. **Assertion :** Transition metals are poor reducing agents.
    Reason : Transition metals form numerous alloys with other metals.
    a) A b) B c) C d) D
111. **Assertion :** Due to Frenkel defect, density of the crystalline solid decreases.
    Reason : In Frenkel defect, cation or anion leaves the crystal.
    a) A b) B c) C d) D
112. **Assertion :** magnetic moment of Dy is the highest among the lanthanoids.
    Reason: Orbital motion contributes magnetic moment.
    a) A b) B c) C d) D
113. **Assertion:** In high spin situation, configuration of d^5 ions will be $t^3_{2g}\, e^2_g$.
    Reason: In high spin situation, pairing energy is less than crystal field energy.
    a) A b) B c) C d) D
114. **Assertion:** Glycerol is purified by distillation under reduced pressure.
    Reason : Steam volatile compounds can by purified by steam distillation.
    a) A b) B c) C d) D
115. **Assertion:** β - pleated sheet structure of protein shows maximum extension.
    Reason: Intermolecular hydrogen bonding is present in them
    a) A b) B c) C d) D
116. **Assertion:** The pKa of acetic acid is lower than that of phenol.
    Reason: Phenoxide ion is more resonance stabilized.
    a) A b) B c) C d) D

117. **Assertion:** On dilution, the equivalent as well as molar conductivity of solution increases
Reason: With dilution, the number of current carrying particles per cm^3 increases
a) A b) B c) C d) D

118. **Assertion:** F_2 has high reactivity
Reason: F – F bond has low bond dissociation enthalpy
a) A b) B c) C d) D

119. **Assertion**: Small quantity of soap used to prepare a stable emulsion
Reason: Soap lower the interfacial tension between oil and water.
a) A b) B c) C d) D

120. **Assertion**: The term anomers of glucose refers to isomers of glucose that differ in configuration at carbon one(C – 1)
Reason: Anomers of glucose are cyclic disastereomers differ in configuration at C – 1 existing in two forms α - and β - Respectively
a) A b) B c) C d) D

121. Which one of the following have the highest number of species in nature
a) Fungi b) Insects
c) Birds d) Angiosperms

122. Ex-situ conservation is carried out in
a) Sanctuary b) National park
c) Biosphere reserve d) Zoo

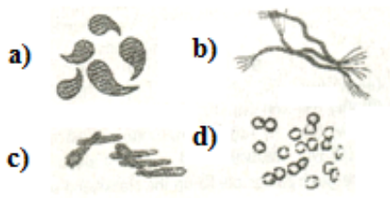
123. In invitro fertilization technique, zygote or early embryo (upto 8 blastomeres) is transferred into
a) Uterus b) Fallopian tube
c) Vagina d) Cervical canal

124. The unique vascular connection between the digestive tract and liver is
a) Hypophysical portal system
b) Hepatic portal system
c) Coronary circulation d) Systematic circulation

125. Ringworm infection is a
a) Helminth disease b) Protozoan disease
c) Viral disease d) Fungal disease

126. The disease that affects the alveoli due to cigarette smoking
a) Asthma b) Emphysema
c) Cyanosis d) Jaundice

127. Which one of the following is the shape of vibrio bacteria



128. Life span of crow is about ---------- years
a) 60 b) 15 c) 16 d) 140

129. In which of the following groups , all listed genera belong to the same class of algae.
a) Chara, Fucus, Polysiphonia
b) Volvox, Spirogyra, Chlamydomonas
c) Porphyra, Ectocarpus, Ulothrix
d) Sargassum, Laminaria, Gracilaria

130. Inner membrane of mitochondria possesses
a) Succinate dehydrogenase
b) ATPase
c) $F_0 – F_1$ particles
d) All of these

131. According to oparin, which one of the following was not present in the primitive atmosphere of the earth?
a) Methane
b) Oxygen
c) Hydrogen
d) Water vapour

132. Animals have the innate ability to escape from predation. Examples for the same are given below. Select the incorrect example
a) Colour change in Chamaeleon
b) Enlargement of body size by swallowing air in puffer fish
c) Poison fangs in snakes
d) Melanism in moths

133. Match the following and select the correct option

A) Earthworm	-	i) Pioneer species
B) Succession	-	ii) Detritivore
C) Ecosystem service	-	iii) Natality
D) Population growth	-	iv) Pollination

a) A-i B-ii c-iii D-iv
b) A-iv B-i c-iii D-ii
c) A-iii B-ii c-iv D-i
d) A-ii B-i c-iv D-iii

134. Kanha National Park is located in ---------- and is famous for ----------
a) Madhya Pradesh, elephant
b) Madhya Pradesh, tiger
c) Odisha, tiger
d) Assam, elephant

135. As a young girl, Sunita suffered a head injury that damaged her pituitary. An injury to the pituitary is particularly serious because of all the functions controlled by this gland. As sunita got older, she and her doctors found that all of the following except ---------- were affected
a) Metabolic rate
b) Blood sugar level
c) Her menstrual cycle
d) Milk production

136. Which of the following element plays an important role in biological nitrogen fixation?
a) Copper
b) Molybdenum
c) Zinc d) Calcium

137. Find the mismatched one

a) Colletotrichum	-	Conidia
b) Ustilago	-	Basidia
c) Claviceps	-	Ascospores
d) Rhizopus	-	Conidia

138. Find out the incorrect statement about cycas
a) Coralloid roots are present
b) They are heterosporous
c) They possess pinnate leaves which persist for a long time
d) The male and female strobili are present on same tree

139. Match Column I with column II and choose the right option:

Column I	Column II
A) Staminode	1) Margins of petals and sepals overlap ,but not in any particular direction
B) Epipetalous	2) Stamens united to one bunch
C) Monoadelphous	3) Sterile stamen
D) Imbricate	4) Stamens attached to petals

a) A-4 B-3 C-2 D-1
b) A-4 B-2 C-3 D-1
c) A-4 B-1 C-2 D-3
d) A-3 B-4 C-2 D-1

140. A large number of scattered vascular bundles is seen in
a) Dicot root
b) Monocot root
c) Dicot stem
d) Monocot stem

141. Select the correct answer from the following statements
1) Cutin is fatty acid polymer
2) Starch is glucose polymer
3) Sucrose is monosaccharide
4) Maltose is polymer of fructose
a) 1, 2, 3 correct b) 1 & 2 correct
c) 2 & 4 correct d) 1 & 3 correct

142. Amino acid present in histones are
a) Arginine and histidine b) Arginine and lysine
c) Lysine and histidine d) Arginine and cytosine

143. Find the mismatched one
a) Phosphorous – Helps in splitting of water
b) Boron – Cell elongation
c) Nitrogen – Required by meristematic tissues
d) Potassium – Activation of enzymes

144. One hormone helps in ripening of fruits and other brings about stomatal closure. They are respectively
a) ABA, IAA b) C_2H_4, ABA
c) ABA, ethylene d) C_2H_4, GA

145. If a short day plant is exposed to light for short duration
a) It will flower normally b) It fails to flower
c) It will flower more faster
d) It will change to long day plant

146. What are the functions of goblet cell?
a) Production of HCl
b) Production of mucus
c) Production of enzyme
d) Production of hormone

147. The alveolar epithelium in the lung is
a) Nonciliated columnar
b) Nonciliated squamous
c) Ciliated columnar
d) Ciliated squamous

148. Parents with blood groups O and AB cannot have AB child as
a) Gene for O is dominant over gene for B
b) Gene for O is dominant over gene for A
c) Genes for A & B are absent in one of the parents
d) Gene 'O' is dominant over gene A& B gene

149. Find the matched option

A) Palm bones	-	1) 7
B) Phalanges	-	2) 8
C) Metatarsals	-	3) 5
D) Tarsals	-	4) 12
	-	5) 14

a) A-3 B-4 C-1 D-2
b) A-3 B-3 C-5 D-1
c) A-5 B-2 C-3 D-1
d) A-3 B-5 C-3 D-1

150. Which is not true about human brain?
a) The brain is covered by cranial meninges
b) Outer layer of cranial meninges is called dura mater
c) Middle thick layer is called pia matter
d) Inner layer which is in contact with brain tissue is called piamater

151. Cavity of vitreous humor is
a) Between choroid and retina
b) Between choroid and sclerotic
c) Behind the lens
d) Between choroid and retina

152. Which of the following is the component of oral pills?
a) Progesterone b) Oxytocin
c) Relaxin d) None of these

153. Portion of gene which is transcribed but not translated is
a) Intron b) Codon
c) Exon d) Cistron

154. Genetic code consists of
a) Adenine and guanine b) Cytosine and uracil
c) Cytosine and guanine d) All the above

155. Hisardale developed through
a) Out crossing
b) Inbreeding
c) Cross breeding
d) Inter specific hybridization

156. In which biome mean annual precipitation is in between 50 & 100 cm
a) Desert b) Grassland
c) Arctic & alpine tundra d) Tropical forest
e) Temperate forest

157. In commensalism
a) Both host and commensalism are benefited
b) Commensal derives benefit
c) The host derives benefit
d) None of these is benefited

158. Genomic library is a collection of
a) Books on genome
b) Seeds
c) Frozen embryos
d) Cloned DNA fragments

159. Which of the following is not a extincted species
a) Thylacine b) Steller's sea cow
c) Nile perch d) Quagga

160. Which of the following act was passed by the government of India to control pollution?
a) Environment Act, 1988
b) Environment (Protection) Act, 1986
c) Protection (Environment) Act, 1988
d) Environment Protection Act, 1968

Read the following questions and choose if

A) Both Assertion and reason are true and the reason is correct explanation of the Assertion

B) Both Assertion and Reason are true, but Reason is not correct explanation of the Assertion

C) Assertion is true, but the Reason is false

D) Both Assertion and Reason are false

E) If the Assertion is false but the reason is true

161. **Assertion :** Reproduction cannot be an all-inclusive defining characteristic of living organisms
Reason: Mules, sterile worker bees, in fertile human couples etc do not reproduce
a) A b) B c) C d) D e) E

162. **Assertion :** Key is a taxonomical aid used for identification of plants and animals
Reason : Zoological parks keeps animals in protected environment
a) A b) B c) C d) D e) E

163. **Assertion**: Slime moulds are Saprophyte protest
Reason: They form plasmodium under unfavourable condition
a) A b) B c) C d) D e) E

164. **Assertion :** Red algae contribute in producing coral reef.
Reason: Some red algae secrete and deposit $CaCo_3$ over their walls.
a) A b) B c) C d) D e) E

165. **Assertion :**Kindgom animalia possess holozoic mode of nutrition
Reason : They digest food and store it as glycogen or fat
a) A b) B c) C d) D e) E

166. **Assertion :** Amphibians are poikilothermous
Reason : Amphibians are able to maintain a constant body temperature
a) A b) B c) C d) D e) E

167. **Assertion:** Bryophytes are used as packing material for trans-shipment of living material
Reason: Bryophytes have a capacity to hold water
a) A b) B c) C d) D e) E

168. **Assertion:** Algae are not exclusively haplontic
Reason: Ectocarpus, polysiphonia and kelps are diplontic
a) A b) B c) C d) D e) E

169. Assertion An ecosystem is an interaction between biotic and abiotic components
Reason AG Tansely coined the term 'ecosystem'.
a) A b) B c) C d) D e) E

170. **Assertion :** Biological names are generally in greek
Reason: The first world in a biological name represents the species while the second component denotes the generic epithet
a) A b) B c) C d) D e) E

171. **Assertion:** Homosapiens belong to hominadae
Reason: It belongs Kingdom. Animalia
a) A b) B c) C d) D e) E

172. **Assertion:** Metabolism is a characteristic feature of life
Reason: Sum total of all the chemical reactions occurring in our body is called metabolism.
a) A b) B c) C d) D e) E

173. **Assertion:** Body of euglena is flexible
Reason: Presence of cell wall make their body flexible
a) A b) B c) C d) D e) E

174. **Assertion:** Binomial nomenclature is introduced by carlous Linneus
Reason: Systema natura is title of his publication
a) A b) B c) C d) D e) E

175. **Assertion :** Rose is a perigynous flower
Reason : Carpel consists of three parts
a) A b) B c) C d) D e) E

176. **Assertion :** Petals are usually brightly coloured
Reason : Corolla is composed of petals
a) A b) B c) C d) D e) E

177. **Assertion:** XX-XY mechanism of sex determination occurs in human beings
Reason: In human, the X-chromosome is longer than Y – chromosome
a) A b) B c) C d) D e) E

178. **Assertion :** Tulip, gloriosa used as ornamentals
Reason : They belong to liliaceae
a) A b) B c) C d) D e) E

179. **Assertion:** The ovules are born on megasporophylls which may be clustered to form the female cones in gymnosperms.
Reason: Male & female cone are borne on same tree in pinus.
a) A b) B c) C d) D e) E

180. **Assertion :** Facilitated diffusion is very specific
Reason: It is sensitive to inhibitors which react with protein side chains
a) A b) B c) C d) D e) E

……..……..…….. space for rough work……...……..

RAYS MED/ENGG. ENTRANCE COACHING
THE SKY IS THE LIMIT

AIIMS BATCH ADMISSION TEST - 2018

WARNING : Any attempt to commit malpractice in the examination will lead to the 'Disqualification' of the candidate

PHYSICS, CHEMISTRY & BIOLOGY

Version Code	**B**	
Time : 3 Hours	Number of Questions: 180	Maximum marks : 720

Name of Candidate	
Reg. Number	
Signature of Candidate	

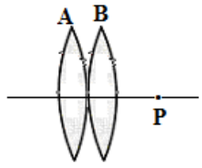
INSTRUCTIONS TO CANDIDATES

1. **Write your Name and Reg. number and put your signature in the space provided above**
2. **Use blue or black ink ball point pen for bubbling.**
3. **Use of calculators and logarithm tables are prohibited.**

IMMEDIATELY AFTER OPENING THE QUESTION BOOKLET, CANDIDATE SHOULD VERIFY WHETHER THE QUESTION BOOKLET ISSUED CONTAINS ALL THE 180 QUESTIONS IN SERIAL ORDER. IF NOT, REQUEST FOR REPLACEMENT

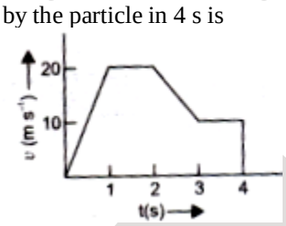
DO NOT OPEN THE BOOKLET UNTIL THE INVIGILATOR ASKS YOU TO DO SO

1. During the adiabatic expansion of 2 moles of a gas, the internal energy was found to have decreased by 100 J. The work done by the gas in the process is
   a) Zero b) -100 J c) 200 J d) 100 J
2. The energy required to accelerate a car from rest to 10 ms^{-1} is E. what energy will be required to accelerate the car from 10 ms^{-1} to 20 ms^{-1}?
   a) E b) 3E c) 5E d) 7 E
3. A person with his hands in his pockets is skating on ice at the rate of 10 ms^{-1} and describes a circle of 50m radius. What is his inclination to the vertical ? (Given : g = 10 ms^{-2}).
   a) $\tan^{-1}\left(\frac{1}{2}\right)$ b) $\tan^{-1}\left(\frac{1}{5}\right)$
   c) $\tan^{-1}\left(\frac{3}{5}\right)$ d) $\tan^{-1}\left(\frac{1}{10}\right)$
4. A particle is confined to rotate in a circular path with decreasing linear speed. Which of the following is correct?
   a) $\vec{L}$ (angular momentum) is conserved about the centre
   b) Only direction of angular momentum $\vec{L}$ is conserved
   c) It spirals towards the centre
   d) Its acceleration is towards the centre
5. A uniform spherical shell gradually shrinks maintaining its shape. The gravitational potential at the centre
   a) Increases b) Decreases
   c) Remains constant d) Oscillates
6. Two point charges placed at a distance r in air experience a certain force. Then the distance at which they will experience the same force in a medium of dielectric constant K is
   a) r/K b) Kr c) $\frac{r}{\sqrt{K}}$ d) $r\sqrt{K}$
7. The resistance of the series combination of two resistance is S. When they are joined in parallel, the total resistance is P. If S = nP, then the minimum possible value of n is
   a) 4 b) 3 c) 2 d) 1
8. A microammeter has a resistance of 100Ω and a full scale range of 50μA. It can be used as a voltmeter or as a higher range ammeter provided a resistance is added to it. Pick the correct range and resistance combination
   a) 50 V range with 10 KΩ resistance is series
   b) 10 V range with 200 KΩ resistance is series
   c) 10 mA range with 1 Ω resistance in parallel
   d) 10 mA range with 1 Ω resistance in parallel
9. The earth's magnetic field at a certain place has a horizontal component 0.3 gauss and the total strength 0.5 gauss. The angle of dip is
   a) $\tan^{-1}\frac{3}{4}$ b) $\sin^{-1}\frac{3}{4}$ c) $\tan^{-1}\frac{4}{3}$ d) $\sin^{-1}\frac{3}{5}$
10. A 0.1 m long conductor carrying a current of 50 A is perpendicular to a magnetic field of 1.25 mT. the mechanical power required to move the conductor with a speed of 1 ms^{-1} is
    a) 6.25 mW b) 6.25 W c) 0.625 W d) 1 W
11. A cell whose diameter is 0.40 m is in a variable magnetic field. As the magnetic induction of the field changes by 127.4 T during 2s, an emf of 200 V is induced in the coil. Then the number of turns in the coil is approximately
    a) 20 b) 25 c) 30 d) 50
12. A hot liquid takes 5 minutes to cool from 70°C to 60°C. How long will it take to cool from 60°C to 50°C?
    a) 5 minutes b) More than 5 minutes
    c) Less than 5 minutes
    d) Less or more than 5 minutes depending on the nature of liquid.
13. The pitch of a screw gauge is 0.5 mm. Its head scale contains 50 divisions. The least count of the screw gauge is
    a) 0.001 mm b) 0.01 mm c) 0.02 mm d) 0.025 mm
14. Power factor is one for
    a) Pure resistor
    b) Pure inductor
    c) Pure capacitor
    d) Either an inductor or a capacitor
15. The speed of electromagnetic wave in a medium of dielectric constant 2.25 and relative permeability 4 is nearly
    a) 1×10^8 ms^{-1} b) 2.5×10^8 ms^{-1}
    c) 2×10^8 ms^{-1} d) 3×10^8 ms^{-1}
16. Two convex lenses placed in contact form the image of a distant object at P. If the lens B is moved to the right, the image will

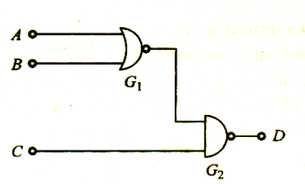


    a) Move to the left
    b) Move to the right
    c) Remain at P
    d) Move either to the left or right, depending upon focal lengths of the lenses.
17. A beam of light of wavelength 600 nm from a distant source falls on a single slit 1 mm wide and a resulting diffraction pattern is observed on a screen 2 m away. The distance between the first dark fringes on either side of central bright fringe is
    a) 1.2 cm b) 1.2 mm c) 2.4 cm d) 2.4 mm
18. In two separate set-ups of the Young's double slit experiment, fringes of equal width are observed when lights of wavelengths in the ratio 1 : 2 are used. If the ratio of the slit separation in two cases is 2 : 1, the ratio of distances, between the plane of slits and the screen, in the two set ups is
    a) 4 : 1 b) 1 : 1 c) 1 : 4 d) 2 : 1
19. The number of photo electrons emitted for light of a frequency v (higher than the threshold v_0) is proportional to
    a) Frequency of light (v) b) $v - v_0$
    c) Threshold frequency (v_0) d) Intensity of light

20. Which of the following quantities has unit Newton per metre (N m^{-1}) ?
    a) force b) Power
    c) Energy d) surface tension.
21. Consider tele communication through optical fibres. Which of the following statements is not true?
    a) Optical fibres can be of graded refractive index
    b) Optical fibres are subjected to electromagnetic interference from outside
    c) Optical fibres have extremely low transmission loss
    d) Optical firbes may have homogenous core with a suitable cladding
22. The instrument for the accurate measurement of the emf of a cell is
    a) A slide wire bridge b) An ammeter
    c) A potentiometer d) A voltmeter
23. A steady current flows in a metallic conductor of non-uniform cross-section. Which of the following quantities is constant along the conductor?
    a) Current b) drift speed
    c) Current density d) None of these
24. The variation of velocity of particle moving along a straight line is shown in figure. The distance travelled by the particle in 4 s is



    a) 25 m b) 30 m c) 55 m d) 60 m
25. Which of the following is wrong about uniform motion
    i) acceleration is zero
    ii) The magnitude of velocity is equal to speed
    iii) The average velocity is equal to instantaneous velocity
    iv) It is not on straight line path and have different directions.
    a) (i) & (iii) b) (i, ii, iv) c) All d) iv
26. For the given combination of gates, if the logic states of inputs, A, B, C are as follows A = B = C = 0 and A = B = 1, C = 0 then the logic states of output D are



    a) 0, 0 b) 0, 1 c) 1,0 d) 1, 1
27. A projectile thrown with a velocity ν at an angle θ has a range R on the surface of earth. For same ν and θ, its range on the surface of moon will be
    a) 36 R b) R/36 c) R/6 d) 6R
28. A body is thrown with a velocity of 10 ms^{-1} at an angle of 60^0 with the horizontal. Its velocity at the highest point is
    a) 7 m s^{-1} b) 9 m s^{-1} c) 18.7 m s^{-1} d)5 m s^{-1}
29. The coefficient of friction between two surfaces is 0.2. The angle of friction is
    a) $\sin^{-1}$ (0.2) b) $\cos^{-1}$ (0.2)
    c) $\tan^{-1}$ (0.1) d) $\cot^{-1}$ (5)
30. Which one among the following shows particle nature of light?
    a) Photoelectric effect b) Interference
    c) Refraction d) Polarization
31. The angle of dip at a place on the earth gives
    a) the horizontal component of the earth's magnetic field
    b) The location of the geographic meridian
    c) the vertical component of the earth's field
    d) The direction of the earth's magnetic field
32. A device which converts electrical energy into mechanical energy is
    a) induction coil b) Electric motor
    c) Generator d) Dynamo
33. Kirchhoff's first law ($\sum$ i = O) and second law ($\sum$ iR = $\sum$E), where symbols have their usual meanings, are, respectively, based on
    a) Conservation of momentum, conservation of energy
    b) Conservation of charge, conservation of energy
    c) Conservation of charge, conservation of momentum
    d) Conservation of energy, conservation of charge
34. A current i ampere flows along an infinitely long straight thin-walled tube. Then the magnetic induction at any point inside the tube is
    a) Infinite b) zero
    c) $\frac{\mu_0}{4\pi}\frac{2i}{r}$ tesla d) $\frac{2i}{r}$ tesla
35. To demonstrate the phenomenon of interference, we require two sources which emit radiation
    a) Of the same frequency and having a definite phase relationship
    b) Of nearly the same frequency
    c) Of the same frequency
    d) Of different wavelengths
36. The force between two charges 0.06 m apart is 5 N. If each charge is moved towards the other by 0.01 m, then the force between them will become
    a) 7.20 N b) 11.25 N c) 22.50 N d) 45.00 N
37. The displacement of the interfering light waves are $y_1 = 4 \sin \omega t$ and $y_2 = 3 \sin (\omega t + \pi/2)$. What is the amplitude of the resultant wave?
    a) 5 b) 7 c) 1 d) Zero
38. For a Plano-convex lens for which μ = 1.5, has radius of curvature 10 cm. It is silvered on its plane surface. Find focal length after silvering
    a) 10 cm b) 20cm c) 15 cm d) 25 cm
39. A bullet of mass 0.1 kg is fired with a speed of 100ms^{-1}, the mass of gun is 50 kg. The velocity of recoil is
    a) 0.2 ms^{-1} b) 0.1 ms^{-1} c) 0.5 ms^{-1} d) 0.05 ms^{-1}
40. A stone of mass 1 kg tied to the end of a string of length 1 m, is whirled in a horizontal circle with a uniform angular velocity of 2 rad s^{-1}. The tension of the string is (in N)
    a) 2 b) $\frac{1}{2}$ c) 4 d) $\frac{1}{4}$

Directions for question 41 to 60
In each of the following questions a statement of Assertion is given followed by corresponding statement of Reason just below it. Of the statements mark the correct answer as
A) If both Assertion and reason are true the reason is the correct explanation of the Assertion
B) If both Assertion and Reason are true but the Reason is not the correct explanation of the Assertion
C) If Assertion is true but Reason is false
D) If both Assertion and Reason are false
E) The Assertion is false but the reason is true

41. **Assertion**: Least count of all screw based instruments is same.
Reason: Least count for all screw based instruments are found using the ratio pitch per division of circular scale.
a) A b) B c) C d) D
42. **Assertion** : The lightening conductor at the top of a high building has sharp ends.
Reason : The surface density of charge at sharp points is very high, resulting in setting up of electric wind
a) A b) B c) C d) D
43. **Assertion** : In a Meter Bridge experiment, null point for an unknown resistance is measured. Now, the unknown resistance is put inside an enclosure maintained at a higher temperature. The null point can be obtained at the same point as before by decreasing the value of the standard resistance.
Reason : Resistance of a metal increases with increase in temperature
a) A b) B c) C d) D
44. **Assertion** : Two bulbs of 40 W and 60 W are connected in series across a d.c source. The potential difference across the 60 W bulb is more than that across the 40 W bulb.
Reason : In a series combination, the potential difference across a bulb is directly proportional to its resistance
a) A b) B c) C d) D
45. **Assertion :** If bodies slide down on a smooth inclined plane without rolling then all bodies reach the bottom simultaneously
Reason : Acceleration of all bodies are equal and independent of the shape
a) A b) B c) C d) D
46. **Assertion :** In an elastic collision in one dimension between two bodies, total momentum remains the same before, during and after the collision
Reason: In an elastic collision in one – dimension between two bodies, total kinetic energy remains the same before, during and after the collision. [Assume external forces are absent in both the above statements)
a) A b) B c) C d) D
47. **Assertion** :A proton and an alpha particle, having the same kinetic energy, are moving in circular paths in a uniform magnetic field. The radii of their circular paths will be equal.
Reason : Any two charged particles having equal kinetic energies and entering a region of uniform magnetic field $\vec{B}$, in a direction perpendicular to $\vec{B}$, will describe circular trajections of equal radii
a) A b) B c) C d) D
48. **Assertion** : Susceptibility is defined as the ratio of intensity of magnetization *I* to magnetic intensity *H*.
Reason : Greater the value of susceptibility, smaller the value of intensity of magnetization
a) A b) B c) C d) D
49. **Assertion** : The coil of a moving coil galvanometer is iscillating. If the two ends of the coil are connected, the oscillations will suddenly stop.
Reason : A current is induced in the coil which opposes the change in flux through the coil
a) A b) B c) C d) D
50. **Assertion:** Some work (non zero) has to be done on a moving particle to change its momentum.
Reason: To change momentum of a particle a non-zero net force should act on it
a) A b) B c) C d) D
51. **Assertion:** A rocket moves forward by pushing eh surrounding air backwards
Reason: It derives the necessary thrust to move forward according to Newton's third law of motion.
a) A b) B c) C d) D
52. **Assertion**: Time period of a hollow ball will be more than that of a solid ball of same radius
Reason: Time period is independent of mass or distribution but on $\sqrt{l}$, where l is the distance between the point of suspension and the centre of the bob.
a) A b) B c) C d) D
53. **Assertion** : If the length of a simple pendulum increases by 3%, then the percentage change in time period will be 1.5%.
Reason : The time period is directly proportional to the length of the pendulum
a) A b) B c) C d) D
54. **Assertion** : For an electric lamp connected in series with a variable capacitor and an AC source ; its brightness increases with increase in capacitance.
Reason : Capacitive reactance decreases with increase in capacitance of capacitor
a) A b) B c) C d) D
55. **Assertion** : A concave mirror and convex lens both have the same focal length in air. When they are submerged in water, they will have same focal length.
Reason : The refractive index of water is smaller than the refractive index of air
a) A b) B c) C d) D
56. **Assertion** : In young's double – slit experiment the two slits are at a distance d apart. Interference pattern is observed on a screen at a distance D from the slits. At a point on the screen which is directly opposite to one of the slits a dark fringe is observed. Then the wavelength of the wave is proportional to the square of the distance between the slits.
Reason : For a dark fringe intensity is zero
a) A b) B c) C d) D

57. **Assertion:** Use of ball bearings between two moving parts of a machine is a common practice
Reason: Ball bearings reduce vibrations and provide good stability
a) A b) B c) C d) D

58. **Assertion:** A man in a closed cabin falling freely does not experience gravity.
Reason: Inertial and gravitational mass shave equivalence
a) A b) B c) C d) D

59. **Assertion:** If we assume that there only two bodies, earth and sun, in the universe. Their size, shape and motion remains same. A frame placed on sun is an inertial frame.
Reason: Inertial frame is non-accelerating in mature.
a) A b) B c) C d) D

60. **Assertion**: An iron ball and a wooden ball are both released at the same height. In the presence of a medium both the balls reach the ground with different velocities and different times.
Reason: Both the ball reach the ground simultaneously.
a) A b) B c) C d) D

61. Which blue solid is obtained on reacting equimolar amount of NO and NO_2 gases at – 30°C?
a) N_2O b) N_2O_3
c) N_2O_4 d) N_2O_5

62. Tyndall effect in colloidal solution is due to
a) Scattering of light b) Reflection of light
c) absorption of light
d) presence of electrically charged particles

63. Which reagent is used to convert 2-butanone into propanoic acid?
a) NaOH, I_2/H^+ b)Tollens' reagent
c) Fehling's solution d) NaOH, NaI/H^+

64. The basic character of transition metal monoxide follows the order
a) VO > CrO > TiO > FeO
b) CrO > VO > FeO > TiO
c) TiO > FeO > VO> CrO
d) TiO > VO > CrO > FeO

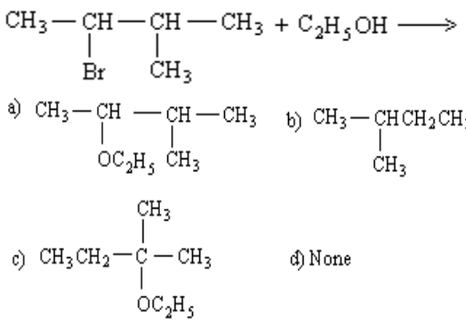
65. Identify the correct statement regarding entropy:
a) At 0°C, the entropy of a perfectly crystalline substance is taken to be zero
b) At absolute zero of temperature, the entropy of a perfectly crystalline substance is +ve
c) At absolute zero of temperature, the entropy of all crystalline substance is taken to be zero
d) At absolute zero of temperature, the entropy of a perfectly crystalline substance is taken to be zero

66. The correct order of first ionization potential is
a) K > Na > Li b) Be > Mg > Ca
c) B > C > N d) Ge > Si > C

67. Calculate the wave number for the longest wavelength transition in the Balmer series of atomic hydrogen.
a) $1.523 \times 10^6\ m^{-1}$ b) $1.523 \times 10^8\ cm^{-1}$
c) $1.523 \times 10^{-6}\ m^{-1}$ d) $1.63 \times 10^6\ cm$

68. Buffer solution can be prepared from a mixture of
a) sodium acetate and acetic acid in water
b) sodium acetate and hydrochloric acid in water
c) Ammonia and ammonium chloride in water
d) Both (a) and (c)

69. The major product via S_N1, reaction is



70. Ice crystallizes in hexagonal lattice. At certain temperature, the density of ice was 0.94 g cm^3. The volume of the unit cell is 1.3×10^{-22} cm^3. The number of H_2O molecules per unit cell is
a) 3 b) 6 c) 4 d) 2

71. A raw material used in making nylon -66 is:
a) Adipic acid
b) Butadiene
c) Ethylene
d) Methyl methacrylate

72. If the solubility product K_{sp} of a sparingly soluble salt MX_2 at 25^0C is 1.0×10^{-11}, the solubility of the salt in mol $litre^{-1}$ at this temperature will be :
a) 2.46×10^{14} b) 1.36×10^{-4}
c) 2.60×10^{-7} d) 1.20×10^{-10}

73. Which of the following complexes is inner orbital complex?
a) $Ni(CO)_4$ b) $[Fe(CN)_6]^{4-}$
c) $[CoF_6]^{3-}$ d) $[Ni(NH_3)_6]^{2+}$

74. Which of the following is not characteristic of Planck's theory of radiation?
a) Radiation is associated with energy
b) Energy is not absorbed or emitted in whole number or multiples of quantum
c) The magnitude of energy associated with a quantum is proportional to the frequency
d) Radiation energy is neither emitted nor absorbed continuously but in small packets called quanta.

75. For a reaction, $X \rightarrow Y$, the graph of the product concentration (x) versus (t) came out to be a straight line passing though the origin. Hence the graph of $\frac{-d[X]}{dt}$ and time would be
a) straight line with a negative slope and an intercept on y – axis
b) straight line with a positive slope and an intercept on y – axis
c) a straight line parallel to x- axis
d) a hyperbola

76. The d – electron configuration of Cr^{2+}, Mn^{2+}, Fe^{2+} and Ni^{2+} are $3d^4$, $3d^5$, $3d^6$ and $3d^8$ respectively. Which one of the following aqua complexes will exhibit the minimum paramagnetic behavior?

(At. No. Cr = 24, Mn = 25, Fe = 26, Ni = 28)

(a) $[Fe(H_2O)_6]^{2+}$ **(b)** $[Ni(H_2O)_6]^{2+}$
(c) $[Cr(H_2O)_6]^{2+}$ **(d)** $[Mn(H_2O)_6]^{2+}$.

77. Oxygen is more electronegative than sulphur. Yet H_2S is acidic while H_2O is neutral. This is because
a) water is a highly associated compound
b) molecular mass of H_2S is more than that of H_2O
c) H_2S is gaseous under ordinary conditions while H_2O is a liquid
d) H – S bond is weaker than H – O bond

78. Flux is used in blast Furnace to
a) Remove all impurities form ores
b) Reduce metal oxide
c) Remove silica
d) Remove silica and undesirable metal oxide

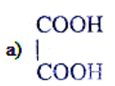
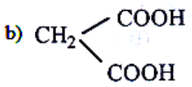
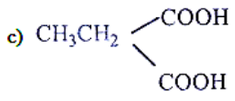
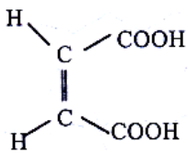
79. Which of the following is isoelectronic as well as isostructural with N_2O?
a) HN_3
b) H_2O
c) NO_2
d) CO_2

80. The reaction / method that does not give an alkane is
a) Catalytic hydrogenation of alkenes
b) Wurtz reaction
c) Hydrolysis of alkylmagnesium bromide
d) Dehydrohalogenation of an alkyl halide

81. The structure and hybridization of $Si(CH_3)_4$ are:
a) bent, sp
b) trigonal, sp^2
c) octahedral, sp^3d^2
d) tetrahedral, sp^3

82. The solubility of metal halides depend on their nature, lattice and hydration enthalpy of the individual ions. Amongst fluorides of alkali metals, the lowest solubility of LiF in water is due to
a) ionic nature of lithium fluoride
b) high lattice enthalpy
c) high hydration enthalpy of lithium ion
d) low ionization enthalpy of lithium atom

83. An organic compound which readily decolourised bromine water and forms an anhydride on heating could be

a) 
b) 
c) 
d) 

84. The correct order of decreasing acidity of nitrophenols will be
a) m – nitrophenol > p– nitrophenol > o – nitrophenol
b) o – nitrophenol > m – nitrophenol > p– nitrophenol
c) p– nitrophenol > m – nitrophenol > o – nitrophenol
d) p– nitrophenol > o – nitrophenol > m – nitrophenol

85. Benzoyl peroxide has a role in which of the following type of addition polymerization?
a) Cationic
b) Anionic
c) Free – radical
d) None of these

86. $N_2 + 3H_2 \rightleftharpoons 2NH_3$. This is gaseous phase reaction taking place in 1L flask at 127°C. Starting with 1 mol N_2 and 3 mol H_2, equilibrium mixture required 500mL of 1 M HCI. Hence K_c is approximately
a) 0.06 b) 0.08 c) 0.03 d) 2.05

87. Which of the following shall form an octahedral complex?
a) d^4 (low spin) b) d^8 (high spin)
c) d^6 (low spin) d) all of these

88. For a given reaction of first order, it takes 20 minutes for the concentration to drop from 1.0 M lit^{-1} to 0.6 M lit^{-1}. The time required for the concentration to drop from 0.6 M lit^{-1} to 0.36 M lit^{-1} will be
a) more than 20 minutes b) less than 20 minutes
c) equal to 20 minutes d) infinity

89. Out of Cu, Ag, Fe and Zn, the metal which can displace all others from their salt solutions is
a) Ag b) Cu c) Zn d) Fe

90. Consider the following relations for emf of an electrochemical cell
(i) EMF of cell = (Oxidation potential of anode) – (Reduction potential of cathode)
(ii) EMF of cell = (Oxidation potential of anode) + (Reduction potential of cathode)
(iii) EMF of cell = (Reductional potential of anode) + (Reduction potential of cathode)
(iv) EMF of cell = (Oxidation potential of anode) – (Oxidation potential of cathode)
a) (iii)and (i) b) (i) and (ii)
c) (iii) and (iv) d) (ii) and (iv)

91. Which ordering of compounds is according to the decreasing order of the oxidation state of nitrogen?
a) HNO_3, NO, NH_4Cl, N_2 b) HNO_3, NO, N_2, NH_4Cl
c) HNO_3, NH_4Cl, NO, N_2 d) NO, HNO_3, NH_4Cl, N_2

92. Which of the following is correct for an ideal gas?
a) $\left(\frac{\partial E}{\partial T}\right)_v = c$ b) $\left(\frac{\partial E}{\partial P}\right)_T = 0$
c) $\left(\frac{\partial E}{\partial T}\right)_P = 0$ d) All of these

93. Which one of the following statement is wrong?
a) Greater the gold number of protective colloid, less is its protective power.
b) Hardy – Schulze rule is applicable only to the coagulation of lyophilic sols.
c) Greater flocculation value of an electrolyte means its poor coagulating power
d) For coagulation of a positive sol, positive ions of the electrolyte have no significance

94. For which of the given sulphides auto – reduction is not applicable?
a) CuS b) PbS c) FeS d) HgS

95. When 2- methyl butan -1- ol is dehydrated to give an alkene; the preferred product is
a) 2- methyl but -1- ene b) but -1- ene
c) but -2- ene d) 2- methyl but -2- ene

96.  (Ketone) can be reduced to RCH_2CH_3 (alkane) by
I. $LiAlH_4$ II. P/ HI
III. Zn(Hg/ con: HCl IV. N_2H_4/C_2H_5ONa
Select correct reagents
a) I, II and III b) I, III and IV
c) I, II and IV d) II, III and IV

97. Arrange the following in the increasing order of size
a) $Al^{3+} < Mg^{2+} < Al < Mg$
b) $Mg < Al < Mg^{2+} < Al^{3+}$
c) $Al^{3+} < Al < Mg^{2+} < Mg$
d) $Mg^{2+} < Al^{3+} < Al < Mg$

98. The following is not an example of gaseous air pollutants:
a) oxides of halogens
b) oxides of sulphur
c) oxides of carbon d) oxides of nitrogen

99. Calcium crystallizes in a face centred cubic lattice and is reported to have 0.2% Schottky defects. If edge length of the unit cell is 5.7×10^{-8} cm, the density of the crystal is
a) 1.54 g cm^{-3} b) 1.02 g cm^{-3}
c) 0.92 g cm^{-3} d) 1.432g cm^{3}

100. Butanone when treated CH_3OH gives
a) Hemi acetal b) acetal c) Cyclicketal d) None

Directions for Qus. 101 to Qus.120 : In every question a statement of ASSERTION followed by a statement of REASON is given. Mark the correct answer out of the following choices.
A. If both assertion and reason are true and the reason is a correct explanation of the assertion.
B. If both assertion and reason are true but reason is not a correct explanation of the assertion.
C. If the assertion is true but reason is false.
D. If both the assertion and reason are false
E. If the assertion is false but the reason is true

101. **Assertion**: Small quantity of soap used to prepare a stable emulsion
Reason: Soap lower the interfacial tension between oil and water.
a) A b) B c) C d) D

102. **Assertion:** Glycerol is purified by distillation under reduced pressure.
Reason : Steam volatile compounds can by purified by steam distillation.
a) A b) B c) C d) D

103. **Assertion :** magnetic moment of Dy is the highest among the lanthanoids.
Reason: Orbital motion contributes magnetic moment.
a) A b) B c) C d) D

104. **Assertion :** *p*ara N-dimethylaminobenzaldehyde undergoes benzoin condensation.
Reason : The aldehydic (-CHO) group is meta directing.
a) A b) B c) C d) D

105. **Assertion:** The pKa of acetic acid is lower than that of phenol.
Reason: Phenoxide ion is more resonance stabilized.
a) A b) B c) C d) D

106. **Assertion :** trans – butene on reaction with bromine forms racemic mixture.
Reason: trans – compound in trans addition forms two types of stereoisomers.
a) A b) B c) C d) D

107. **Assertion**: The term anomers of glucose refers to isomers of glucose that differ in configuration at carbon one(C – 1)
Reason: Anomers of glucose are cyclic disastereomers differ in configuration at C – 1 existing in two forms α - and β - Respectively
a) A b) B c) C d) D

108. **Assertion :** Bleaching powder reacts with dilute acids to evolve chlorine.
Reason : The chlorine liberated by the action of dilute acids on bleaching powder is called available chlorine.
a) A b) B c) C d) D

109. **Assertion:** On dilution, the equivalent as well as molar conductivity of solution increases
Reason: With dilution, the number of current carrying particles per cm^3 increases
a) A b) B c) C d) D

110. **Assertion :** O_3 can act as an oxidizing agent as well as a reducing agent, but SO_2 can act only as an oxidant.
Reason: The oxidation number of O in O_3 is zero, and the oxidation number of S in SO_2 is +4.
a) A b) B c) C d) D

111. **Assertion :** Due to Frenkel defect, density of the crystalline solid decreases.
Reason : In Frenkel defect, cation or anion leaves the crystal.
a) A b) B c) C d) D

112. **Assertion :** A reaction which is spontaneous and accompanied by decrease of randomness must be exothermic
Reason : All exothermic reactions are accompanied by decease of randomness.
a) A b) B c) C d) D

113. **Assertion :** The pressure of a fixed amount of an ideal gas is proportional to its absolute temperature.
Reason: The frequency of collisions and their impact both increase in proportion to the square root of temperature.
a) A b) B c) C d) D

114. **Assertion :** C – O bond in metal carbonyl is long .
Reason: There is delocalization of electrons from filled d orbitals into the empty orbitals on the CO lignads.
a) A b) B c) C d) D

115. **Assertion:** If H_2 and Cl_2 enclosed separately in the same vessel exert pressure of 100 and 200 mm respectively, their Mixture in the same vessel at the Same temperature will exert a pressure of 300 mm.
Reason : Dalton's law of partial pressures states that total pressure is the sum of partial pressures.
a) A b) B c) C d) D

116. **Assertion:** Ebonite is highly vulcanised rubber.
Reason: Perlon is used in the manufacture of fibres.
a) A b) B c) C d) D

117. **Assertion :** Transition metals are poor reducing agents.
Reason : Transition metals form numerous alloys with other metals.
a) A b) B c) C d) D

118. **Assertion:** In high spin situation, configuration of d^5 ions will be $t^3_{2g}\, e^2_g$.
Reason: In high spin situation, pairing energy is less than crystal field energy.
a) A b) B c) C d) D

119. **Assertion:** β - pleated sheet structure of protein shows maximum extension.
Reason: Intermolecular hydrogen bonding is present in them
a) A b) B c) C d) D

120. **Assertion:** F_2 has high reactivity
Reason: F – F bond has low bond dissociation enthalpy
a) A b) B c) C d) D

121. A large number of scattered vascular bundles is seen in
a) Dicot root b) Monocot root
c) Dicot stem d) Monocot stem

122. Select the correct answer from the following statements
1) Cutin is fatty acid polymer
2) Starch is glucose polymer
3) Sucrose is monosaccharide
4) Maltose is polymer of fructose
a) 1, 2, 3 correct b) 1 & 2 correct
c) 2 & 4 correct d) 1 & 3 correct

123. Which of the following is not a extincted species
a) Thylacine b) Steller's sea cow
c) Nile perch d) Quagga

124. Which of the following act was passed by the government of India to control pollution?
a) Environment Act, 1988
b) Environment (Protection) Act, 1986
c) Protection (Environment) Act, 1988
d) Environment Protection Act, 1968

125. Find the mismatched one
a) Phosphorous – Helps in splitting of water
b) Boron – Cell elongation
c) Nitrogen – Required by meristematic tissues
d) Potassium – Activation of enzymes

126. One hormone helps in ripening of fruits and other brings about stomatal closure. They are respectively
a) ABA, IAA b) C_2H_4, ABA
c) ABA, ethylene d) C_2H_4, GA

127. If a short day plant is exposed to light for short duration
a) It will flower normally b) It fails to flower
c) It will flower more faster
d) It will change to long day plant

128. Which of the following element plays an important role in biological nitrogen fixation?
a) Copper b) Molybdenum
c) Zinc d) Calcium

129. Find the mismatched one
a) Colletotrichum - Conidia
b) Ustilago - Basidia
c) Claviceps - Ascospores
d) Rhizopus - Conidia

130. Find out the incorrect statement about cycas
a) Coralloid roots are present
b) They are heterosporous
c) They possess pinnate leaves which persist for a long time
d) The male and female strobili are present on same tree

131. Which is not true about human brain?
a) The brain is covered by cranial meninges
b) Outer layer of cranial meninges is called dura mater
c) Middle thick layer is called pia matter
d) Inner layer which is in contact with brain tissue is called piamater

132. Cavity of vitreous humor is
a) Between choroid and retina
b) Between choroid and sclerotic
c) Behind the lens
d) Between choroid and retina

133. Which of the following is the component of oral pills?
a) Progesterone b) Oxytocin
c) Relaxin d) None of these

134. Portion of gene which is transcribed but not translated is
a) Intron b) Codon
c) Exon d) Cistron

135. Animals have the innate ability to escape from predation. Examples for the same are given below. Select the incorrect example
a) Colour change in Chamaeleon
b) Enlargement of body size by swallowing air in puffer fish
c) Poison fangs in snakes
d) Melanism in moths

136. Life span of crow is about ---------- years
a) 60 b) 15
c) 16 d) 140

137. In which of the following groups , all listed genera belong to the same class of algae.
a) Chara, Fucus, Polysiphonia
b) Volvox, Spirogyra, Chlamydomonas
c) Porphyra, Ectocarpus, Ulothrix
d) Sargassum, Laminaria, Gracilaria

138. Inner membrane of mitochondria possesses
a) Succinate dehydrogenase b) ATPase
c) $F_0 – F_1$ particles d) All of these

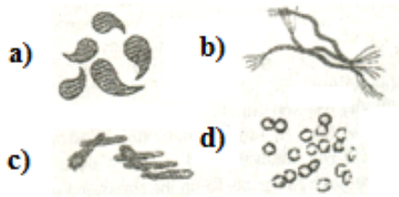
139. Which one of the following have the highest number of species in nature
a) Fungi b) Insects
c) Birds d) Angiosperms

140. Ex-situ conservation is carried out in
a) Sanctuary b) National park
c) Biosphere reserve d) Zoo

141. Hisardale developed through
a) Out crossing
b) Inbreeding
c) Cross breeding
d) Inter specific hybridization

142. In which biome mean annual precipitation is in between 50 & 100 cm
a) Desert b) Grassland
c) Arctic & alpine tundra d) Tropical forest
e) Temperate forest

143. In commensalism
   a) Both host and commensalism are benefited
   b) Commensal derives benefit
   c) The host derives benefit
   d) None of these is benefited
144. Genomic library is a collection of
   a) Books on genome
   b) Seeds
   c) Frozen embryos
   d) Cloned DNA fragments
145. In invitro fertilization technique, zygote or early embryo (upto 8 blastomeres) is transferred into
   a) Uterus b) Fallopian tube
   c) Vagina d) Cervical canal
146. The unique vascular connection between the digestive tract and liver is
   a) Hypophysical portal system
   b) Hepatic portal system
   c) Coronary circulation d) Systematic circulation
147. Ringworm infection is a
   a) Helminth disease b) Protozoan disease
   c) Viral disease d) Fungal disease
148. The disease that affects the alveoli due to cigarette smoking
   a) Asthma b) Emphysema
   c) Cyanosis d) Jaundice
149. Which one of the following is the shape of vibrio bacteria



150. According to oparin, which one of the following was not present in the primitive atmosphere of the earth?
   a) Methane b) Oxygen
   c) Hydrogen d) Water vapour
151. Match the following and select the correct option

A) Earthworm	-	i) Pioneer species
B) Succession	-	ii) Detritivore
C) Ecosystem service	-	iii) Natality
D) Population growth	-	iv) Pollination

   a) A-i B-ii c-iii D-iv
   b) A-iv B-i c-iii D-ii
   c) A-iii B-ii c-iv D-i
   d) A-ii B-i c-iv D-iii
152. Kanha National Park is located in ---------- and is famous for ----------
   a) Madhya Pradesh, elephant
   b) Madhya Pradesh, tiger
   c) Odisha, tiger
   d) Assam, elephant
153. As a young girl, Sunita suffered a head injury that damaged her pituitary. An injury to the pituitary is particularly serious because of all the functions controlled by this gland. As sunita got older, she and her doctors found that all of the following except ---------- were affected
   a) Metabolic rate b) Blood sugar level
   c) Her menstrual cycle d) Milk production
154. Match Column I with column II and choose the right option:

Column I	**Column II**
A) Staminode	1) Margins of petals and sepals overlap ,but not in any particular direction
B) Epipetalous	2) Stamens united to one bunch
C) Monoadelphous	3) Sterile stamen
D) Imbricate	4) Stamens attached to petals

   a) A-4 B-3 C-2 D-1
   b) A-4 B-2 C-3 D-1
   c) A-4 B-1 C-2 D-3
   d) A-3 B-4 C-2 D-1
155. Amino acid present in histones are
   a) Arginine and histidine b) Arginine and lysine
   c) Lysine and histidine d) Arginine and cytosine
156. What are the functions of goblet cell?
   a) Production of HCl b) Production of mucus
   c) Production of enzyme
   d) Production of hormone
157. The alveolar epithelium in the lung is
   a) Nonciliated columnar
   b) Nonciliated squamous
   c) Ciliated columnar
   d) Ciliated squamous
158. Parents with blood groups O and AB cannot have AB child as
   a) Gene for O is dominant over gene for B
   b) Gene for O is dominant over gene for A
   c) Genes for A & B are absent in one of the parents
   d) Gene 'O' is dominant over gene A& B gene
159. Find the matched option

A) Palm bones	-	1) 7
B) Phalanges	-	2) 8
C) Metatarsals	-	3) 5
D) Tarsals	-	4) 12
	-	5) 14

   a) A-3 B-4 C-1 D-2
   b) A-3 B-3 C-5 D-1
   c) A-5 B-2 C-3 D-1
   d) A-3 B-5 C-3 D-1
160. Genetic code consists of
   a) Adenine and guanine
   b) Cytosine and uracil
   c) Cytosine and guanine
   d) All the above

Read the following questions and choose if

A) Both Assertion and reason are true and the reason is correct explanation of the Assertion

B) Both Assertion and Reason are true, but Reason is not correct explanation of the Assertion

C) Assertion is true, but the Reason is false

D) Both Assertion and Reason are false

E) If the Assertion is false but the reason is true

161. **Assertion:** The ovules are born on megasporophylls which may be clustered to form the female cones in gymnosperms.
   Reason: Male & female cone are borne on same tree in pinus.
   a) A b) B c) C d) D e) E

162. **Assertion :** Facilitated diffusion is very specific
Reason: It is sensitive to inhibitors which react with protein side chains
a) A b) B c) C d) D e) E

163. **Assertion :** Amphibians are poikilothermous
Reason : Amphibians are able to maintain a constant body temperature
a) A b) B c) C d) D e) E

164. **Assertion:** Bryophytes are used as packing material for trans-shipment of living material
Reason: Bryophytes have a capacity to hold water
a) A b) B c) C d) D e) E

165. **Assertion:** Algae are not exclusively haplontic
Reason: Ectocarpus, polysiphonia and kelps are diplontic
a) A b) B c) C d) D e) E

166. Assertion An ecosystem is an interaction between biotic and abiotic components
Reason AG Tansely coined the term 'ecosystem'.
a) A b) B c) C d) D e) E

167. **Assertion:** Metabolism is a characteristic feature of life
Reason: Sum total of all the chemical reactions occurring in our body is called metabolism.
a) A b) B c) C d) D e) E

168. **Assertion:** Body of euglena is flexible
Reason: Presence of cell wall make their body flexible
a) A b) B c) C d) D e) E

169. **Assertion:** Binomial nomenclature is introduced by carlous Linneus
Reason: Systema natura is title of his publication
a) A b) B c) C d) D e) E

170. **Assertion :** Rose is a perigynous flower
Reason : Carpel consists of three parts
a) A b) B c) C d) D e) E

171. **Assertion**: Slime moulds are Saprophyte protest
Reason: They form plasmodium under unfavourable condition
a) A b) B c) C d) D e) E

172. **Assertion :** Red algae contribute in producing coral reef.
Reason: Some red algae secrete and deposit $CaCo_3$ over their walls.
a) A b) B c) C d) D e) E

173. **Assertion :** Reproduction cannot be an all-inclusive defining characteristic of living organisms
Reason: Mules, sterile worker bees, in fertile human couples etc do not reproduce
a) A b) B c) C d) D e) E

174. **Assertion :** Key is a taxonomical aid used for identification of plants and animals
Reason : Zoological parks keeps animals in protected environment
a) A b) B c) C d) D e) E

175. **Assertion :**Kindgom animalia possess holozoic mode of nutrition
Reason : They digest food and store it as glycogen or fat
a) A b) B c) C d) D e) E

176. **Assertion :** Biological names are generally in greek
Reason: The first world in a biological name represents the species while the second component denotes the generic epithet
a) A b) B c) C d) D e) E

177. **Assertion:** Homosapiens belong to hominadae
Reason: It belongs Kingdom. Animalia
a) A b) B c) C d) D e) E

178. **Assertion :** Petals are usually brightly coloured
Reason : Corolla is composed of petals
a) A b) B c) C d) D e) E

179. **Assertion:** XX-XY mechanism of sex determination occurs in human beings
Reason: In human, the X-chromosome is longer than Y – chromosome
a) A b) B c) C d) D e) E

180. **Assertion :** Tulip, gloriosa used as ornamentals
Reason : They belong to liliaceae
a) A b) B c) C d) D e) E

……..…….…….. space for rough work……...……..